Rock Chips
Spring/Summer 2004

Alberta Geological Survey

Reorganization at the Alberta Geological Survey

The AGS last restructured four years ago in January 2000 into two large geo-technically oriented sections (one focused on Minerals and the other on Energy), a Geoscience Support Section (administration, computing, facilities, etc.) and two 'enabling' teams (intended to build strengths in mapping, geographic information systems (GIS), related databases and digital tools). The reorganization enabled AGS to create more detailed, cost-effective digital products. In general the structure worked very well and the productivity and effectiveness of AGS increased significantly. **So why change?**

The key reasons for the change are about focus and accountability. The broad, commodity-based minerals and energy sections did not, at first glance, appear to address the business plans and outcomes of the Alberta government, its departments and, specifically, the Alberta Energy and Utilities Board (EUB).

At the highest level, the Alberta government has three core businesses – People, Prosperity and Preservation – and goals are established for each of the core businesses. In addition, there are four priority cross-ministry policy initiatives (the Aboriginal Policy Initiative, the Alberta Children and Youth Initiatives, the Economic Development Initiative and the Health Sustainability Initiative). Within the Ministry of Energy, comprising the Department of Energy and the EUB, there are six core businesses.

The Department of Energy's Core Businesses

Securing Benefits for Albertans	Secure Albertans' share and benefits from energy and mineral resource development.
Resource Development	Ensure Alberta's energy and mineral resources remain competitive and attractive to investment and development.
Awareness and Understanding	Inform Albertans about energy and mineral resource development and related policies, and the significance of these resources to Alberta's economy.
Energy for Albertans	Ensure Alberta consumers have a choice of reliable and competitively priced energy.

The EUB's Core Businesses

Adjudication and Regulation	The EUB adjudicates and regulates matters related to energy and utilities within Alberta to ensure the development, transportation and monitoring of the province's energy resources are in the public interest. In addition, the EUB balances the interests of customers and investor-owned utilities in establishing rates, terms and conditions of services. The EUB provides this assurance through its activities in the application and hearing process, standards setting and regulation, monitoring, and surveillance and enforcement.
Information and Knowledge	The information and knowledge responsibility of the EUB includes the collection, storage, analysis, appraisal, dissemination and stakeholder awareness of information. Open access to information develops awareness, understanding, and responsible behaviour and allows the EUB and stakeholders to make informed decisions about energy and utility matters.

EUB Alberta Energy and Utilities Board
AGS

Programs and projects at the AGS contribute directly to many of the core businesses of the government, particularly to those of the Ministry of Energy (the AGS supports both the policy and regulatory arms of the ministry). In addition, AGS contributes to two of the cross-ministry initiatives: the Aboriginal Policy Initiative and the Economic Development Initiative. There are also a number of government strategies, such as Alberta's Water for Life and the Alberta Mineral Strategy, which provide a direct role for AGS products.

How the AGS Contributes

The **mission** of the Alberta Geological Survey is to provide geoscience information and expertise needed by government, industry and the public for earth-resources stewardship and sustainable development in Alberta.

Our responsibilities include

- delineate and characterize Alberta's earth resources;
- build and further develop Alberta's geoscience information base;
- disseminate geoscience data and information;
- participate in geoscience research activities in support of the energy and minerals industries in Alberta;
- provide expertise and knowledge to our stakeholders.

It is through specific programs and projects that contributions are made.

Programs and projects at AGS can be grouped and (see chart on next page) connected to a core business, initiative or strategy (lower boxes):

In essence, the top boxes represent the collection of activities with a focused theme around which new sections at the AGS have been formed.

Northern Mapping Section (Leader - Glen Prior)

- Undertakes regional geoscience mapping programs, primarily in the northern part of Alberta, to address information and knowledge needs in the energy, mineral and environmental sectors.
- Current activities include surficial mapping, Quaternary stratigraphic drilling, drift thickness and bedrock topography studies, till and stream sediment geochemistry and heavy mineral surveys, stream water geochemistry surveys, and the preparation of aggregate potential maps.

Rock Chips is published twice yearly by the Alberta Geological Survey in the spring/summer and the fall/winter.

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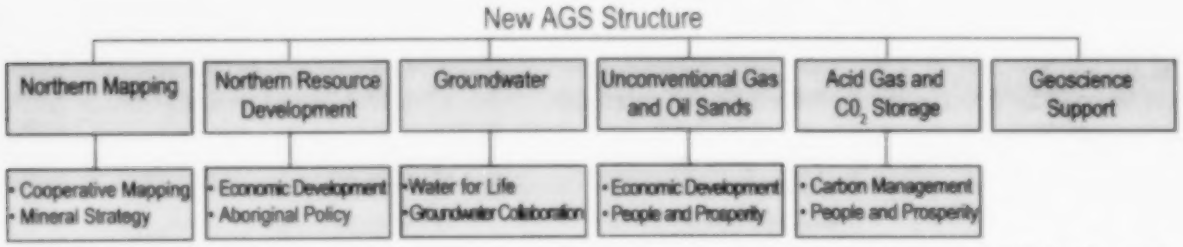
Clients in the Calgary area may view AGS publications at the Alberta Energy and Utilities Board Library, 640 - 5th Avenue SW.



Northern Resource Development Section
(Leader - Reg Olson)

- Focuses predominantly on mineral resource studies and mapping to provide data and information that will encourage industry to conduct exploration in Alberta and provide government with information that will guide land use management.
- Provides expertise and knowledge about the mineral potential of Alberta to a variety of stakeholders.
- Provides metallogenic potential studies, thematic mineral mapping, study of Alberta kimberlites, basement and structural mapping, regional stratigraphic compilations and analysis, mineral aggregate and industrial mineral studies and mapping, remote predictive mapping, and outreach about the mineral potential of Alberta, with emphasis on communities in northern Alberta, including aboriginal people.

Groundwater Section (Leader - Kevin Parks)

- Investigates and reports on the complete hydrogeology of the Athabasca and Cold Lake Oil Sands "In-Situ" Areas, from basement to surface, in support of energy industry regulation at EUB.
- Investigates the effect of CBM development on groundwater.
- Supports Alberta's Water for Life Strategy by providing geoscience support to other government agencies managing groundwater issues.

Unconventional Gas and Oil Sands Section
(Leader - Andrew Beaton)

- Investigates the geology, distribution, characterization and production potential of coal, coalbed methane and shale gas in Alberta.
- Contributes to the geological understanding of the Athabasca Oil Sands by developing and refining the regional stratigraphic and sedimentological framework of the deposits.
- Provides geological information to the public, government agencies and industry for regulatory support and to assist the responsible development of Alberta's coal, oil sand and unconventional energy resources.

Acid Gas and CO_2 Storage Section
(Leader - Matt Grobe)

- Evaluates Alberta's potential for geological sequestration of greenhouse and acid gases (CO_2 and H_2S) and identifies, characterizes and reports on sites deemed suitable for early large-scale implementation.
- Supports the EUB and the Alberta Department of Energy with geoscience information and expert advice to implement the policy and regulatory environment for the sequestration of greenhouse and acid gases in geological media in Alberta.
- Supports the Strategic Research Plan of the Alberta Energy Research Institute (AERI) and participates in its projects through developing methods and implementing techniques for the assessment of CO_2 sequestration in oil and gas reservoirs, deep saline aquifers, coal and salt beds.

Geoscience Support (Leader - Barry Fildes)

- Operates the AGS Library, a member of the NEOS library consortium, to support the work of the AGS' geoscientists.
- Operates the AGS Information Sales office, which sells AGS' publications.
- Provides administrative and computing support, including support of the AGS Web site at http://www.ags.gov.ab.ca/.

The reason for change is about focus and accountability.

In 2004-05, our program and projects under this new structure will identify goals and outcomes that address specific core business, initiatives or strategies.

Our program may be seen at http://www.ags.gov.ab.ca

The current staffing of the new sections may be viewed on our web site at http://www.ags.gov.ab.ca/Staff/ ❖

Surficial Mapping in the Zama Lake Area (NTS 84L)

In 2003, the Alberta Geological Survey (AGS), British Columbia Ministry of Energy and Mines (BCMEM) and the Geological Survey of Canada (GSC) initiated a four-year collaborative project in northwestern Alberta and northeastern British Columbia. This project falls under the GSC's Northern Resource Development Program (NRD Project 4450) and has additional support through the Federal-Provincial Targeted Geoscience Initiative (TGI-2).

This past summer, Quaternary geologists from the AGS and GSC were busy conducting a mapping program in the Zama Lake (NTS 84L) map area. Surficial geology mapping and studies of Quaternary stratigraphy were undertaken in support of future oil and gas development, mineral exploration, forestry and land use development and recent interest in unconventional shallow gas. Studies provided

- a reconstruction of glacial ice flow history important to the successful application of drift prospecting;
- the identification of granular resources essential for the maintenance and development of road access and infrastructure;
- a better understanding for the stratigraphic setting of unconventional natural gas trapped at shallow depths (<350 m) in unconsolidated glacial and nonglacial sediment; and
- an assessment of the extent of active and relict permafrost features, and landslides that could affect development.

This project will also be beneficial to the Dene Tha' First Nations in any land-use/ecological classification exercises they may undertake.

Fieldwork was conducted during June, July and September 2003 and provided continuity with the surficial mapping being conducted by BCMEM and the GSC in the adjacent (west) Fontas River (NTS 94I) and Petitot River (NTS 94P) map areas. At the completion of this project, the result will be a fully integrated digital surficial geology database with seamless maps across the provincial border. During fieldwork, particular attention was paid to stratigraphy, ice flow indicators and the highly variable nature of surface sediments. Reconnaissance-level till sampling for kimberlite-indicator minerals and drift geochemistry were also completed. Considerable progress was made in unravelling the glacial and post-glacial history of the region.

The Fort Nelson Lowland dominates the physiography of the region (Figure 1), and separates Cameron Hills Uplands to the north and Clear Hills Uplands to the south. The characteristic flat topography and expansive peatlands reflect the deposition of extensive glaciolacustrine sediment in glacial Lake Hay, which inundated most of the region below 405 m above sea level (asl) during deglaciation.

Figure 1. Mature poplar stands northwest of the town of Rainbow Lake characterize the Fort Nelson Lowland. Seismic cut lines can be seen extending off into the horizon.

Scientific highlights of the fieldwork included the discovery of several bedrock outcrops in the region. Dunvegan Formation sandstone (Upper Cretaceous) outcrops along meltwater channels and occurs below a thin veneer of till on Basset Hill, the upland along the southern map boundary and the southern Chinchaga Plain to the south, usually above 650 m asl. Shale of the upper Fort St. John Group (Shaftesbury Formation, Lower to Upper Cretaceous) outcrops east and south of the town of Rainbow Lake (Figure 2) and along the Chinchaga River south of Highway 58 (Figure 3). Elsewhere, drift thickness is variable, from <1 m on topographic highs to >300 m in the Sousa Creek area and Chinchaga River lowlands.

An extensive subglacial tunnel valley (valley eroded by a meltwater stream underneath the glacier) and ice-contact meltwater complex was observed in the southwestern corner of the map area extending from east of Rainbow Lake well into British Columbia (Figure 4). Two very large subaerial fan deposits along the Hay

Figure 2. Sulphur-stained marine shale of the Fort St. John Group (Shaftesbury Formation) is exposed in a gully on the north edge of a bedrock ridge south of Hay-Zama lakes lowland.

Figure 3. Outcrop of Fort St. John Group (Shaftesbury Formation) marine shale along the Chinchaga River, south of Highway 58.

Figure 4. Large tunnel valley and meltwater channel extending west of Rainbow Lake. Glacial meltwater flowing within this large channel was responsible for depositing the large gravel deposits currently used by the town of Rainbow Lake. The horizon extends into British Columbia.

River are associated with this deglacial system. One lies 15 km west of the Alberta/B.C. border, and a second is situated within Alberta, 15 km downstream of Rainbow Lake. Other notable glaciofluvial features include meltwater channels east and west of Chinchaga River, south of Highway 58. These are excellent sources of sand and gravel in a region that otherwise has limited aggregate potential.

Ice flow history was reconstructed from streamlined landforms, striated boulder pavements and till pebble fabrics. These measurements indicate that the uppermost two tills in the region (a meltout till overlying a lodgement till) were deposited by ice flowing southwest and west-southwest. Crosscutting flutings in the southern map area indicate that a southwest ice flow occurred prior to the final deglacial west-southwest ice flow. During initial Late Wisconsin glaciation (about 22,000 years ago), the Laurentide Ice Sheet advanced westward, up-drainage, into the region forming large ice-dammed lakes. The clast-poor, clayey till found throughout the map area reflects the reworking of regional shale bedrock and overriden glaciolacustrine sediment. During deglaciation, eastward and northward retreating glaciers continued to impound the regional drainage, resulting in the formation of Glacial Lake Hay. The thickest (>15 m) Glacial Lake Hay sediments were deposited in the Chinchaga River valley, north of Highway 58 (Figure 5). Former shorelines of Glacial Lake Hay can be seen

Figure 5. Glacial Lake Hay sediments exposed along the Chinchaga River. Dense deep-water (distal) grey silty-clay is sharply and conformably overlain by shallow-water sandy beds, likely indicative of a sudden drop in Glacial Lake Hay water levels.

Figure 6. The fall colours of poplar trees highlight a former shoreline of Glacial Lake Hay that occupied the Hay-Zama lakes lowland (at left).

Figure 7. A large ribbed fen, north of Hay River near the British Columbia border, with thermokarst scars resulting from the melting of permafrost.

north and south of present day Zama and Hay lakes (Figure 6).

Extensive permafrost, ground which has been frozen all year round for more than two years, is considered to have existed following deglaciation, as evidenced by widespread polygonal patterning in fine-grained glaciolacustrine sediment and peatlands. Although much of this is considered to be relict, discontinuous permafrost is present in the region today as indicated by active thermokarst, which is distinguished by irregular ground surfaces due to the melting of ground ice (Figure 7), and frozen ground encountered below 1.7 m depth. ❖

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Surficial Mapping Project for 2004-2005	Roger Paulen	(780) 427-2851
Field Trip of the Oldman Lead-Zinc Prospect	Randy Rice	(780) 427-2872

Geoscape Edmonton Poster Released

Geoscape Edmonton is an illustrated poster of interesting geological facts, features and history in and around Edmonton. The first Geoscape poster was published in 1996 by the Geological Survey of Canada (GSC). Dr. Bob Turner and Dr. John Clague believed a generalized poster about the geology of Vancouver would be a useful and interesting tool for educators and the general public. The poster was extremely well received and other communities in Canada started similar projects. Currently there are posters for 16 cities and regions in 9 provinces and territories, plus a Geoscape Canada.

- British Columbia – Vancouver, Victoria, Nanaimo and the Fraser River Basin
- Alberta – Edmonton and Calgary
- Saskatchewan – Southern Saskatchewan
- Manitoba – Winnipeg
- Ontario – Toronto, Ottawa and the Grand River Basin
- Quebec – Montreal and Quebec City
- Nova Scotia – Halifax
- Yukon – Whitehorse
- Nunavut – Nunavut

All of the posters provide practical earth science information on communities across Canada in an effort to better inform Canadians about important geoscience issues in their areas. More information is available at Geoscape Canada http://geoscape.nrcan.gc.ca.

In 1998, the Calgary branch of the GSC began creating a Geoscape poster for the Calgary region under the direction of Dr. Terry Poulton. Dr. Poulton contacted Dixon Edwards with the Alberta Geological Survey, for input on the poster, especially on the topic of industrial minerals (e.g., limestone, building stone, and sand and gravel). Four years later, in 2002, Geoscape Calgary was officially released as a GSC publication. Building on the success of the Geoscape Calgary poster, the AGS approved the preparation of a Geoscape Edmonton.

The Geology of Our Back Yard: Geoscape Edmonton

The Geoscape Edmonton poster was created to illustrate how intertwined geology and resources are with the history of Edmonton and to provide a resource for anyone interested in the natural environment of Edmonton. It is especially well suited to primary and secondary students.

Geoscape Edmonton is a 98 by 68 centimetre (38 x 27 inch) illustrated poster about the earth in Edmonton's backyard. A dozen AGS staff, geologists from the Provincial Museum of Alberta and the GSC, and four local area teachers contributed to the development of the poster. The cost of printing was shared between the Edmonton Geological Society and the AGS.

Intentions are to send Geoscape Edmonton to Ottawa for French translation and further review so it can be re-introduced as a joint AGS/GSC publication. A preview version of the poster can be seen on the AGS Web site at www.ags.gov.ab.ca/publications/pdf_downloads/Geoscape_Edmonton.pdf

A common feature of all geoscape posters is the use of topic panels. Geoscape Edmonton is composed of eight separate topic panels. Each panel can be used as a separate study module. The information is provided in a clear and concise format using general terms.

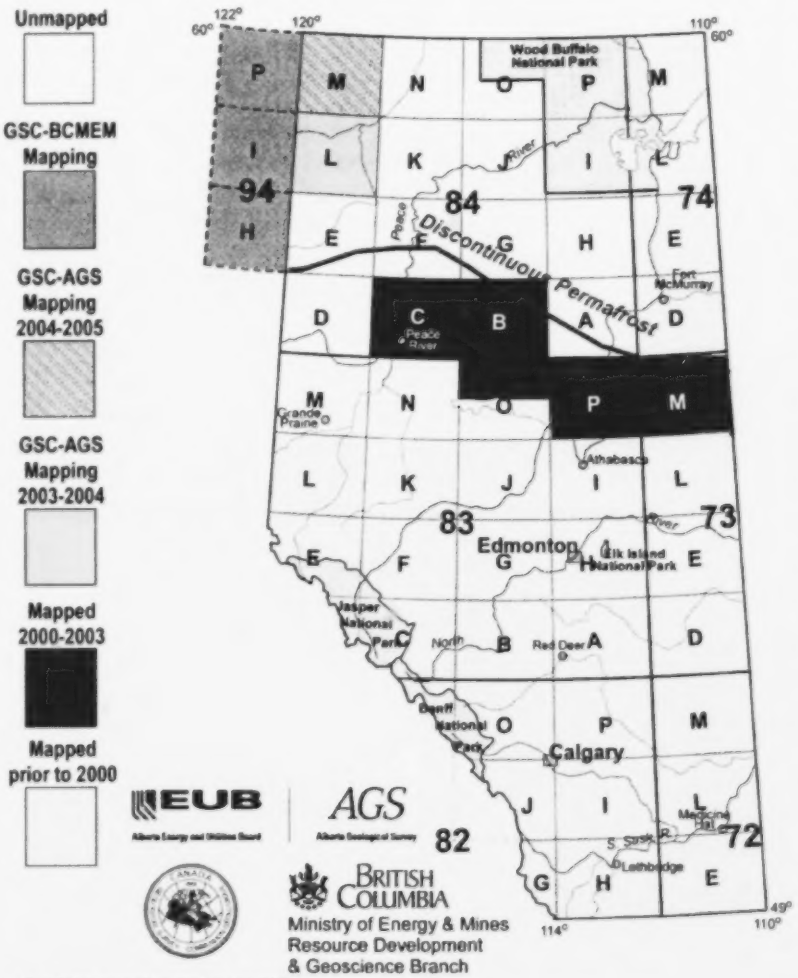
Geoscape Calgary can be purchased from the AGS or the GSC (Calgary) for $15. Geoscape Edmonton can be purchased for $10 from the Alberta Geological Survey or the Edmonton Geological Society (427-2843). A bulk purchase rate of $2.00/copy is available from AGS for orders of 25 or more of the Edmonton poster. A complimentary copy for educators will be considered through the EGS Outreach to Schools Program. ❖

Geoscape
Edmonton
Geological Time
Regional Resources
Geohazards
River Valley Geology
Valley Resources
Glacial Geology
Groundwater

Surficial Mapping Project for 2004-2005

This year, the Alberta Geological Survey marks the fifth year in its long-term, regional surficial mapping initiative for northern Alberta. Exploration for minerals, including diamonds and shallow gas, remains active in northern Alberta. Thus, the Alberta Geological Survey continues to support the exploration community by providing baseline geological information.

The Alberta Geological Survey enters the second year of a four-year collaborative, multi-disciplinary project with the Geological Survey of Canada (GSC) and the British Columbia Ministry of Energy and Mines. Alain Plouffe and Rod Smith (GSC) will participate in completing the surficial mapping for one of the most remote regions of the province. The goal of this multi-partnered project is to map the surficial geology in northeastern British Columbia and northwestern Alberta with continuous, seamless digital map coverage.



Surficial mapping status for Alberta.

This year, the project objective is to complete the mapping of Bistcho Lake (NTS 84M), which shares the provincial border with British Columbia to the west and the Northwest Territories to the north. This region has a small population at Zama City, which continues to grow around a conventional energy play north of Hay Lake. However, recent interest in natural gas trapped in nonconventional, unconsolidated glacial and nonglacial sediment reservoirs has created an additional demand for information about the local surficial sediments, Quaternary stratigraphy and sediment properties to accommodate the increasing demand for infrastructure (e.g., granular aggregate, landslide potential and permafrost).

Maps containing surficial geology, Quaternary stratigraphy and glacial history information are important to mineral exploration in northern Alberta. Surficial geology maps also provide important information on the various types of surficial materials, ice flow transport directions and delineates regions containing suitable sampling material (e.g., till) for drift prospecting surveys. Through this work, AGS provides basic geological information for mineral exploration and resource development in northern Alberta. ❖

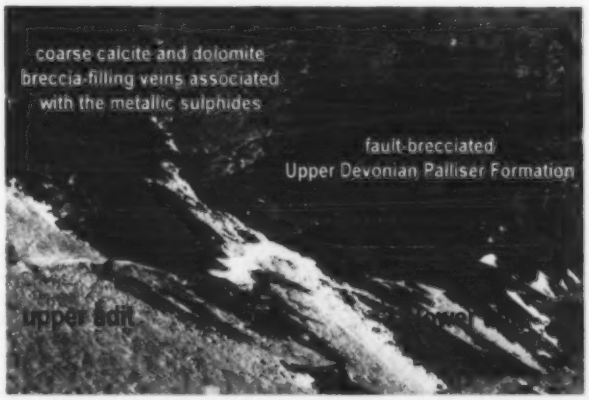
AGS-GSC Joint Fieldtrip to the Oldman Lead-Zinc Prospect

From 2001 to 2003, the Alberta Geological Survey (AGS), Geological Survey of Canada, Calgary (GSC) and the C.S. Lord Northern Geoscience Centre, Yellowknife, Northwest Territories, were co-participants in a federally sponsored Targeted Geoscience Initiative project investigating the Mississippi Valley-type lead-zinc (Pb-Zn) potential of northern Alberta and the southernmost Northwest Territories. However, early-known Pb-Zn occurrences, such as the Oldman River prospect in southwestern Alberta, were not formally included. For this reason, an informal joint AGS-GSC fieldtrip was organized to visit the prospect, which is the best known of the early discoveries of Pb-Zn occurrences in Alberta. Bob Sharp, former chief geologist at Cominco's now closed Polaris Pb-Zn mine, joined the trip as an industry expert. AGS participants were Dinu Pană and Randy Rice with Peter Hannigan representing the GSC, Calgary.

Location and Access

The Oldman Pb-Zn prospect is located at approximately 2290 metres on a spur on the east slope of Mount Gass in the High Rock Range of southwestern Alberta (NTS 82J/02). It is best accessed from the southern limits of Calgary by taking Highway 22X west to Highway 22 and proceeding south on this highway past Longview to the intersection with Secondary Road 532. This road is followed to its intersection with the Forestry Trunk Road (940), which is then followed south to the Oldman River. At the Oldman River, follow a road running northwest along the north bank of the river to a trail located approximately where Oyster Creek intersects the river, but before the gated-off extension of the road. This location is also a staging site for guided trail rides along the crest of the High Rock Range, which uses the trail to the prospect as an access route. The trail to the prospect is obvious to follow and can be traversed on foot (3 hrs), by horseback or ATV. GPS coordinates (NAD 27, zone 11) for the upper and lower adit at the prospect are respectively 5555227N, 663068E and 5555268N, 663008E.

The Oldman River Pb-Zn prospect located at about 2290 metres on a spur on the east slope of Mount Gass in the High Rock Range of southwest Alberta. The person in the photo is standing in front of the upper adit. Photo believed to have been taken about 1953 or 1954.



The Oldman River Pb-Zn prospect as it looked in September 2003. The upper adit has largely collapsed, but the lower adit is still open about 15 metres to its termination.

History of the Oldman River Pb-Zn Prospect

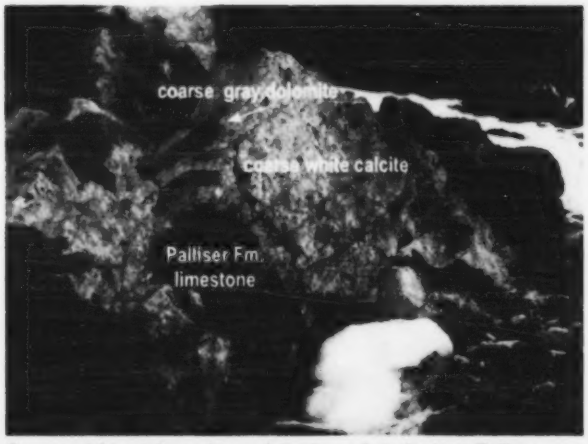
The best sources of information on the prospect are reports by Holter (1973, 1977) and Godfrey (1985). The Web site, Peaks of the Canadian Rockies (http://www.peakfinder.com/), also provides concise information on the discovery of the prospect. Depending on the source, the Oldman River Pb-Zn prospect was initially discovered either by the Stony Indian, King Bearspaw, early in the 20th century (Peaks of the Canadian Rockies Web site), or by a group of hunters in 1912. Western Canadian Collieries later acquired the claims and developed two adits during 1953 to 1954. During the short life of the prospect, 'ore' was loaded into boxes and winched up a chute over the east ridge of the mountain to a very rough road (Peaks of the Canadian Rockies Web site). Sid Ward of Western Canadian Collieries did the initial geological work at the site from 1953 to 1954. Brief observations from the site were included in the paper of GSC geologist D.K. Norris, who visited the prospect during his work on the Beehive Mountain map area. AGS personnel, M.E. Holter and W.N. Hamilton, also visited the site in 1970 and published a review of Sid Ward's earlier work. Godfrey included a summary of Holter's paper in his review of Pb-Zn occurrences in Alberta and part of B.C.

View looking south along the High Rock Range from the trail immediately above the Oldman River Pb-Zn prospect. Mr - Mississippian Rundle Group, Mb - Mississippian Banff Formation, Dp - Upper Devonian Palliser Formation. Beehive Mountain lies in the distance. Formation contacts from Holter.

View looking north along the High Rock Range from the spur on Mount Gass lying above the Oldman River Pb-Zn prospect. Mr - Mississipian Rundle Group, Mb - Mississippian Banff Formation, Dp - Upper Devonian Palliser Formation. Formation contacts from Holter.

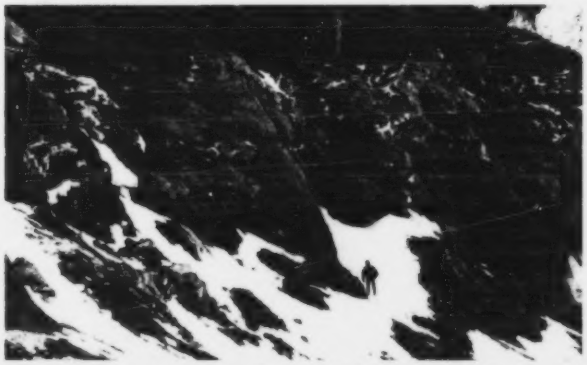
Geology

When the site was visited in September 2003, the weather was clear in the High Rock Range and patches of old snow remained on nearby slopes and at the entrance to the upper and lower adits. Access was not impeded, however, and the authors spent several hours examining both adits. The Pb-Zn mineralized zone is structurally controlled and associated with coarse crystalline white calcite and grey dolomite that have been deposited into faulted and brecciated Upper Devonian Palliser Formation host carbonate.



Coarse white calcite and grey dolomite pods in the host Palliser Formation limestone at the entrance to the upper adit.

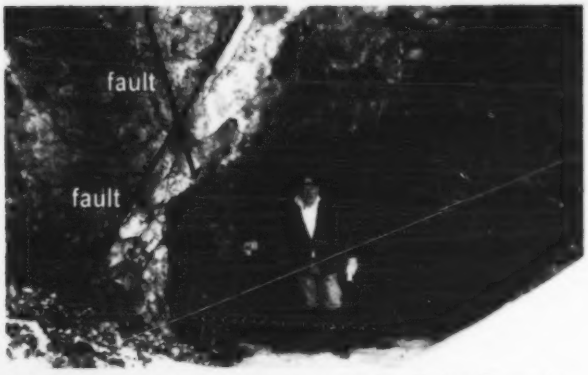
Holter reports the mineralized zone occurs about 15 metres from the top of the formation and the entire formation as being thrust eastward over the Upper Jurassic to Lower Cretaceous Kootenay Group by movement along the underlying (about 60 metres) Lewis Thrust. The upper adit had largely collapsed, but the lower one was intact and was examined.



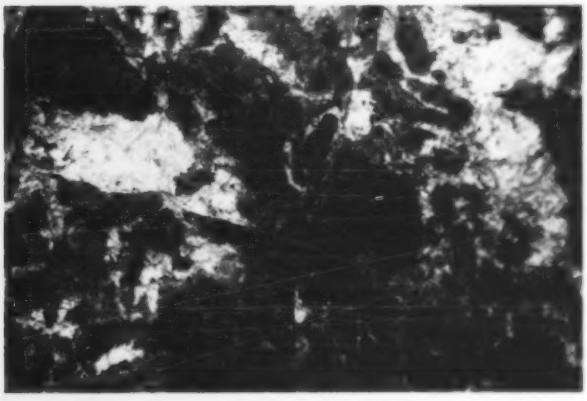
Peter Hannigan at the lower adit of the Oldman River Pb-Zn prospect. Note the breccia-filling calcite and dolomite in the host Palliser Formation above the adit.

The entrance and the interior faces of the lower adit are rust stained, faulted and comprise zones of calcite and dolomite; there appears to be two main fault directions at the adit entrance. Holter also concluded that the mineralization was structurally controlled and concentrated at the intersection of north-south thrust or high-angle faults and east-west tear faults.

He reports the sulphides as comprising galena, pyrite and sphalerite, with minor marcasite and cerussite. However, only minor amounts of galena, pyrite and marcasite are now evident; for example, along a



Bob Sharp at the entrance to the lower adit. The Palliser Formation here is faulted (black lines indicate principal fault directions) and is mineralized by coarse calcite and dolomite. Galena was not abundant, but was recovered from the fault inclined toward the entrance to the adit.



A face inside the lower adit. The Palliser Formation is faulted, brecciated and mineralized with coarse calcite and dolomite.

high-angle fault at the entrance to the lower adit. Prior assay results from a, presumably, high-graded 10-ton bulk sample taken from the portal of the upper adit comprise: 31.5% lead, 7.3% zinc, trace gold, and 2.2 oz/short ton silver. This ten tons of ore sold for $390 to Consolidated Mining and Smelting of Canada Limited. As a result of the 2003 visit, it was agreed that a more detailed structural analysis could be done, and a second visit to the site is planned. ❖

Recently Released AGS Publications

Earth Sciences Report

ESR 2002-07 Petrographic Characteristics of Selected Kimberlitic Rocks in Northern Alberta. 11.5 MB PDF. $20.00

Geo-Notes

GEO 2003-02 Carbonate-Hosted Pb-Zn (MVT) in Northeastern Alberta - 2002 Core Program: A Contribution to the Carbonate-Hosted Pb-Zn (MVT) Targeted Geoscience Initiative. 38.4 MB PDF. $20.00

GEO 2003-11 Orthorectified and Principal Component RADARSAT-1 Image Dataset for NTS 73M, Alberta. 477 MB PDF. $20.00

GEO 2003-12 Orthorectified and Principal Component RADARSAT-1 Image Dataset for NTS 74D, Alberta. 471 MB PDF. $20.00

GEO 2003-13 Orthorectified and Principal Component RADARSAT-1 Image Dataset for NTS 74E, Alberta. 467 MB PDF. $20.00

GEO 2003-14 Orthorectified and Principal Component RADARSAT-1 Image Dataset for NTS 74L, Alberta. 454 MB PDF. $20.00

GEO 2003-15 Orthorectified and Principal Component RADARSAT-1 Image Dataset for NTS 74M, Alberta. 462 MB PDF. $20.00

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Maps

(Sand and gravel maps are scaled at 1:250 000)

MAP 270 Sand and Gravel Deposits with Aggregate Potential, Bitumount, Alberta (NTS 74E). 658 KB PDF. $20.00

MAP 271 Sand and Gravel Deposits with Aggregate Potential, Waterways, Alberta (NTS 74D). 644 KB PDF. $20.00

MAP 272 Sand and Gravel Deposits with Aggregate Potential, Drumheller, Alberta (NTS 82P). 755 KB PDF. $20.00

MAP 273 Sand and Gravel Deposits with Aggregate Potential, Calgary, Alberta (NTS 82O). 1.08 MB PDF. $20.00

MAP 274 Sand and Gravel Deposits with Aggregate Potential, Gleichen, Alberta (NTS 82I). 792 KB PDF. $20.00

MAP 276 Sand and Gravel Deposits with Aggregate Potential, Wabamun Lake, Alberta (NTS 83G). 1.39 MB PDF. $20.00

MAP 277 Sand and Gravel Deposits with Aggregate Potential, Edmonton, Alberta (NTS 83H). 1.05 MB PDF. $20.00

MAP 280 Sand and Gravel Deposits with Aggregate Potential, Red Deer, Alberta (NTS 83A). 1.27 MB PDF. $20.00

MAP 281 Sand and Gravel Deposits with Aggregate Potential, Rocky Mountain House, Alberta (NTS 83B). 1.07 MB PDF. $20.00

MAP 282 Sand and Gravel Deposits with Aggregate Potential, Lesser Slave Lake, Alberta (NTS 83O). 694 KB PDF. $20.00

MAP 283 Sand and Gravel Deposits with Aggregate Potential, Edson, Alberta (NTS 83F). 1.22 MB PDF. $20.00

MAP 284 Sand and Gravel Deposits with Aggregate Potential, Vermilion, Alberta (NTS 73E). 930 KB PDF. $20.00

MAP 285 Sand and Gravel Deposits with Aggregate Potential, Sand River, Alberta (NTS 73L). 920 KB PDF. $20.00

MAP 287 Sand and Gravel Deposits with Aggregate Potential, Lethbridge, Alberta (NTS 82H). 1.15 MB PDF. $20.00

MAP 296 Sand and Gravel Deposits with Aggregate Potential, Foremost, Alberta (NTS 72E). 727 KB PDF. $20.00

MAP 297 Sand and Gravel Deposits with Aggregate Potential, Medicine Hat, Alberta (NTS 72L). 1.05 MB PDF. $20.00

MAP 300 Sand and Gravel Deposits with Aggregate Potential, Pelican River, Alberta (NTS 83P). 519 KB PDF. $20.00

MAP 302 Sand and Gravel Deposits with Aggregate Potential, Peerless Lake, Alberta (NTS 84B). 561 KB PDF. $20.00

MAP 303 Sand and Gravel Deposits with Aggregate Potential, Peace River, Alberta (NTS 84C). 637 KB PDF. $20.00

MAP 304 Sand and Gravel Deposits with Aggregate Potential, Chinchaga River, Alberta (NTS 84E). 368 KB PDF. $20.00

MAP 305 Sand and Gravel Deposits with Aggregate Potential, Bison Lake, Alberta (NTS 84F). 435 KB PDF. $20.00

MAP 307 Sand and Gravel Deposits with Aggregate Potential, John D'Or Prairie, Alberta (NTS 84J). 597 KB PDF. $20.00

MAP 308 Sand and Gravel Deposits with Aggregate Potential, Mount Watt, Alberta (NTS 84K). 569 KB PDF. $20.00

MAP 309 Sand and Gravel Deposits with Aggregate Potential, Zama Lake, Alberta (NTS 84L). 423 KB PDF. $20.00

MAP 310 Sand and Gravel Deposits with Aggregate Potential, Bistcho, Alberta (NTS 84M). 413 KB PDF. $20.00

MAP 311 Sand and Gravel Deposits with Aggregate Potential, Steen River, Alberta (NTS 84N). 415 KB PDF. $20.00

MAP 326 Sand and Gravel Deposits with Aggregate Potential, Wainwright, Alberta (NTS 73D). 870 KB PDF. $20.00

MAP 327 Sand and Gravel Deposits with Aggregate Potential, Oyen, Alberta (NTS 72M). 918 KB PDF. $20.00

The following 4 maps are sold on 1 CD, Surficial Geology of the Peace River Area, (NTS 84C), Alberta. The price is $25.00.

MAP 289 Surficial Geology of the Southwest Buffalo Head Hills Area (NTS 84C/NE). Scale 1:100 000

MAP 290 Surficial Geology of the Cadotte Lake Area (NTS 84C/SE). Scale 1:100 000

MAP 291 Surficial Geology of the Grimshaw Area (NTS 84C/SW). Scale 1:100 000

MAP 289 Surficial Geology of the Manning Area (NTS 84C/NW). Scale 1:100 000

Mineral Assessment Reports

MIN 20020014 2000 - 2002 Exploration of the South Slave Block Property North-Central, Alberta. 84 p.

MIN 20020009 Window Prospect, Coliseum Mountain. 20 p.

MIN 20020011 A Report and Background Information Pertinent to the Exploration and Analysis of the Bad Heart Sandstone on Permits 9396110003 and 9396110004. 147 p.

MIN 20020012 Assessment Report Swan Hills Property, North-Central Alberta. 292 p. and 13 maps.

MIN 20020013 2000 - 2002 Exploration of the Mooney Block Property North-Central, Alberta. 24 p.

MIN 20030001 Metallic and Industrial Mineral Permit 9300110003 Northern Alberta. 35 p. 2004

MIN 20030002 Metallic and Industrial Minerals Permit No. 9396110054. 9 p. 2004

MIN 20030003 Assessment Report for Exploration Conducted on the Little Legend Property and Surrounding Area, Birch Mountains, Northeastern Alberta. 94 p. 2004

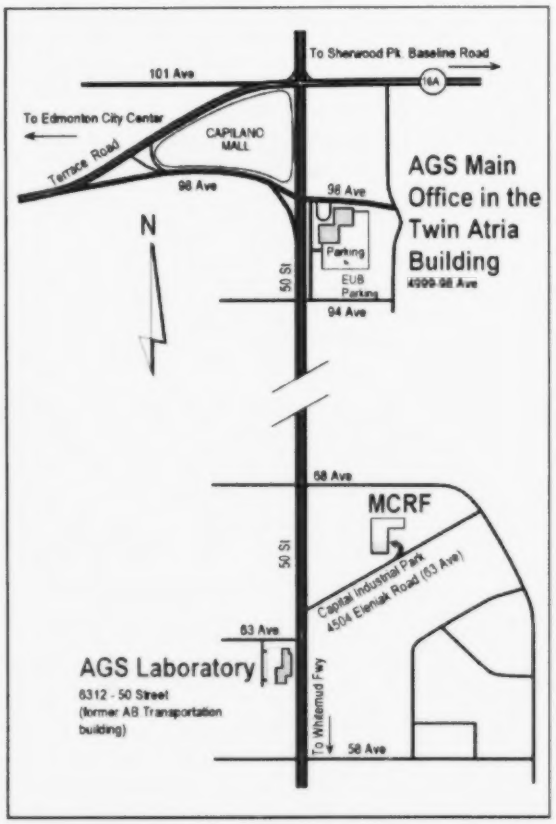
Special Reports

SPE 62 Development, Stratigraphy and Summary Diagenetic History of the Athabasca Basin, Early Proterozoic of Alberta and Its Relation to Uranium Potential. 15.8 MB PDF. $20.00

SPE 68 Clearwater County Regional Groundwater Assessment - Final. 536 MB. $20.00

SPE 69 M.D. of Lesser Slave River No. 124 Regional Groundwater Assessment - Final. 388 MB. $20.00

SPE 70 Yellowhead County Regional Groundwater Assessment - Final. 512 KB. $20.00



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The Alberta Geological Survey Library is located at the address above and may be contacted at
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Our Mineral Core Research Facility (MCRF) is located at

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